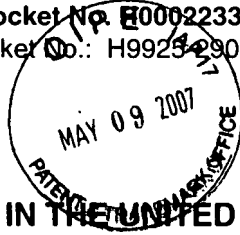




Honeywell Docket No. H0002233 USA - 4018
Buchalter Docket No.: H99254905



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Paul Silinger

Application No.: 10/765782

Group No.: 1753

Filed: June 11, 2003

Examiner: Luan V. Van

For: **INTERNAL HEAT SPREADER PLATING METHODS AND DEVICES**

**MAIL STOP APPEAL BRIEF – PATENTS
COMMISSIONER FOR PATENTS
P.O. Box 1450
ALEXANDRIA, VA 22313-1450**

APPELLANT'S BRIEF UNDER 37 CFR § 41.37

This brief follows the appellant's Notice of Appeal filed in this case on March 9, 2007. The fees required under 37 CFR §1.17(f) are included with this brief.

This brief contains the following items under the headings in the order here indicated:

APPELLANTS BRIEF UNDER 37 CFR § 41.37

REAL PARTY IN INTEREST

RELATED APPEALS AND INTERFERENCES

STATUS OF THE CLAIMS

STATUS OF AMENDMENTS

SUMMARY OF CLAIMED SUBJECT MATTER

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

ARGUMENT

CLAIMS APPENDIX

EVIDENCE APPENDIX

RELATED PROCEEDINGS APPENDIX

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REAL PARTY IN INTEREST

The real party in interest is the assignee, Honeywell International Inc. (see Reel/Frame No. 012910/0226, Recorded on May 20, 2002)

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences in this matter known to appellant.

STATUS OF THE CLAIMS

There are 18 claims in this case.

Claims 16-18 were canceled in the Response to the First Office Action dated April 10, 2006.

Claims 1-15 are pending.

STATUS OF AMENDMENTS

There have been no amendments filed subsequent to final rejection in this matter.

SUMMARY OF THE CLAIMED SUBJECT MATTER

The subject matter of the present application, including independent claims 1 and 15, is directed to plating systems for heat spreaders and other related parts.

The first independent claim is directed to a plating system comprising: an elongated upper channel and an elongated lower channel (Page 2, lines 2-13); and a plating solution horizontal sparger comprising a series of inlets oriented to direct any plating solution flowing through the inlets into one and towards another of the upper and lower channels. (Page 2, lines 2-13)

The second independent claim is directed to a plating system comprising: an anode (Page 2, lines 9-13), a planar cathode (Page 4, lines 2-5), a horizontal sparger (Page 3, lines 17-25, Page 4, lines 8-15 and Figure 2), and a plurality of electrically insulating shields (Page 6, lines 19-25); wherein each of the plurality of shields is positioned between the anode and the cathode but not between the sparger and the cathode, and each of the plurality of shields is approximately co-planar with one of two reference planes that are substantially parallel to the cathode (Figures 2 and 3 – entire Figures as presented); and the sparger is adapted to direct plating fluid toward and edge of the cathode along in a plane substantially co-planar with cathode. (Figures 2 and 3 – entire Figures as presented, Page 6, lines 4-9)

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1, 2, 9 and 12 are rejected under 35 USC §102(b) as being anticipated by Admitted Prior Art (Fig. 1, Page 1 of the Applicant's disclosure) or, in the alternative, under 35 USC §103(a) as obvious over Admitted Prior Art.

Claims 1-15 are rejected under 35 USC §103(a) as being unpatentable over Admitted Prior Art in view of Lace et al.

ARGUMENT

**ISSUE NO. 1 - §102 AND 103 REJECTION OF CLAIMS 1, 2, 9 AND 12 BASED ON APPLICANT'S
ADMITTED PRIOR ART**

Claims 1, 2, 9 and 12 are rejected under 35 USC §102(b) as being anticipated by Admitted Prior Art (Fig. 1, Page 1 of the Applicant's disclosure) or, in the alternative, under 35 USC §103(a) as obvious over Admitted Prior Art. The Applicants respectfully disagree.

Claim 1 recites:

"A plating system comprising:

an elongated upper channel and an elongated lower channel; and

a plating solution horizontal sparger comprising a series of inlets oriented to

direct any plating solution flowing through the inlets into one and towards another of the upper and lower channels."

As pointed out in the Specification, an improved plating system 100 is shown in **Figure 2** which provides for improved metal distribution over a work piece 900. In the improved system 100, the vertical spargers (spargers 11 in **Figure 1**) found in prior art plating systems are eliminated and fluid 800 enters the chamber 120 through the bottom of the chamber with the bottom of the chamber acting as a horizontal sparger 110. By eliminating the vertical spargers, the distance D2 between the part being plated 900 and the shields 130 can be decreased (with a corresponding decrease in the distance D4 between the fields forming the sides of the channel).

As the Specification also specifically points out, the system of **Figure 2** may be obtained by modifying the system of **Figure 1** (a Technic Inc. MP 300 – and Applicant's

Admitted Prior Art) in the following manner: (1) eliminating the tubular vertical solution spargers and replacing them with holes 111 fabricated in the lower plenum so that solution travels around the parts to be plated as a turbulent flow from the bottom of the parts to the tops, and not from the sides; (2) increasing the solution velocity; (3) moving the shields closer to the parts to be plated (cathodes); (4) incorporating part holding clamps sufficiently narrow so as to adequately hold the part while still permitting the claims and parts to move between the shields; and (5) incorporating a double rinsing and drying process where the plating/part holding fixture is rinsed and dried first, and the plated part and lower half of the fixture are subsequently rinsed and dried. These modifications to the Technic system render the claims of the current application patentable as not anticipated by Technic, because Technic cannot possibly anticipate the modifications disclosed in the current system and recited in the claims.

As stated in the last Response, applicant's Admitted Prior Art does not teach all of the claimed elements of the present application. "Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." *W. L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983) (citing *Soundsciber Corp. v. United States*, 360 F.2d 954, 148 USPQ 298, 301 (Ct. Cl.), *adopted*, 149 USPQ 640 (Ct. Cl. 1966)) Further, the prior art reference must disclose each element of the claimed invention "arranged as in the claim". *Lindermann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)). Applicant's Admitted Prior Art does not teach a plating solution horizontal sparger comprising a series of inlets oriented to direct any plating solution flowing through the inlets into one and towards another of the upper and lower channels.

The Examiner responded by stating that "the vertical spargers of Admitted Prior Art as shown in Fig. 1 are broadly interpreted to be a horizontal sparger." The Applicant

respectfully questions the authority of this statement. Admitted Prior Art Figure 1 shows vertical spargers that rise up from the bottom of the chamber, crowd the workpiece and effectively lead to a much larger chamber. The horizontal spargers in the present application are part of the bottom of the chamber, do not crowd the workpiece, and result in a much smaller chamber size.

In the Examiner's Advisory Action, the Examiner stated that: "The plating solution in Admitted Prior Art as shown in Fig. 1 is fed through the bottom inlets on the bottom of the plating compartment 12 into the vertical spargers. The plurality of said bottom inlets in Admitted Prior Art as shown in Fig. 1 broadly read on the plating solution of the instant claims." The Examiner however fails to mention that the current application eliminates the tubular vertical solution spargers in the Admitted Prior Art and replaces them with holes 111 fabricated in the lower plenum so that solution travels around the parts to be plated as a turbulent flow from the bottom of the parts to the tops, and not from the sides. The Examiner is building a structure for the Applicant that the Applicant has not claimed. The vertical spargers of Admitted Prior Art have been removed and replaced with horizontal spargers. Therefore, Admitted Prior Art can't possibly anticipate or render unpatentable the claims of the present application.

Based on this argument, Applicant's Admitted Prior Art does not anticipate claim 1 of the present application because Applicant's Admitted Prior Art is lacking and/or missing at least one specific feature or structural recitation found in the present application, and in claim 1. Claim 1 is therefore allowable as not being anticipated by Applicant's Admitted Prior Art. Further, Applicant's Admitted Prior Art does not anticipate claims 2, 9 and 12 of the present application by virtue of their dependency on claim 1.

In addition, Applicant's Admitted Prior Art cannot render unpatentable claim 1 of the present application, because one of ordinary skill in the art cannot possibly review

the Admitted Prior Art on its face and, remove the vertical spargers, place horizontal spargers in the bottom of the chamber and arrive at claim 1.

**ISSUE NO. 2 - §103 (A) REJECTION OF CLAIMS 1-15 BASED ON APPLICANT'S ADMITTED PRIOR
ART IN VIEW OF LACE ET AL.**

Claims 1-15 are rejected under 35 USC §103(a) as being unpatentable over Admitted Prior Art in view of Lace et al. The Applicants respectfully disagree.

Claim 1 recites:

"A plating system comprising:
an elongated upper channel and an elongated lower channel; and
a plating solution horizontal sparger comprising a series of inlets oriented to
direct any plating solution flowing through the inlets into one and towards
another of the upper and lower channels."

Claim 15 recites:

"A plating system comprising:
an anode, a planar cathode, a horizontal sparger, and a plurality of electrically
insulating shields; wherein
each of the plurality of shields is positioned between the anode and the cathode
but not between the sparger and the cathode, and each of the plurality of
shields is approximately co-planar with one of two reference planes that
are substantially parallel to the cathode; and
the sparger is adapted to direct plating fluid toward and edge of the cathode
along in a plane substantially co-planar with cathode."

As pointed out in the Specification, an improved plating system 100 is shown in **Figure 2** which provides for improved metal distribution over a work piece 900. In the improved system 100, the vertical spargers (spargers 11 in **Figure 1**) found in prior art plating systems are eliminated and fluid 800 enters the chamber 120 through the bottom of the chamber with the bottom of the chamber acting as a horizontal sparger 110. By eliminating the vertical spargers, the distance D2 between the part being plated 900 and the shields 130 can be decreased (with a corresponding decrease in the distance D4 between the fields forming the sides of the channel).

As the Specification also specifically points out, the system of **Figure 2** may be obtained by modifying the system of **Figure 1** (a Technic Inc. MP 300 – and Applicant's Admitted Prior Art) in the following manner: (1) eliminating the tubular vertical solution spargers and replacing them with holes 111 fabricated in the lower plenum so that solution travels around the parts to be plated as a turbulent flow from the bottom of the parts to the tops, and not from the sides; (2) increasing the solution velocity; (3) moving the shields closer to the parts to be plated (cathodes); (4) incorporating part holding clamps sufficiently narrow so as to adequately hold the part while still permitting the claims and parts to move between the shields; and (5) incorporating a double rinsing and drying process where the plating/part holding fixture is rinsed and dried first, and the plated part and lower half of the fixture are subsequently rinsed and dried. These modifications to the Technic system render the claims of the current application patentable over Technic, because Technic cannot possibly render unpatentable the modifications disclosed in the current system and recited in the claims, because one of ordinary skill in the art would not view the Admitted Prior Art alone or in combination with Lace and arrive at the present disclosure or claims.

The Examiner responded by stating that "the vertical spargers of Admitted Prior Art as shown in Fig. 1 are broadly interpreted to be a horizontal sparger." The Applicant respectfully questions the authority of this statement. Admitted Prior Art Figure 1 shows

vertical spargers that rise up from the bottom of the chamber, crowd the workpiece and effectively lead to a much larger chamber. The horizontal spargers in the present application are part of the bottom of the chamber, do not crowd the workpiece, and result in a much smaller chamber size.

In the Examiner's Advisory Action, the Examiner stated that: "The plating solution in Admitted Prior Art as shown in Fig. 1 is fed through the bottom inlets on the bottom of the plating compartment 12 into the vertical spargers. The plurality of said bottom inlets in Admitted Prior Art as shown in Fig. 1 broadly read on the plating solution of the instant claims." The Examiner however fails to mention that the current application eliminates the tubular vertical solution spargers in the Admitted Prior Art and replaces them with holes 111 fabricated in the lower plenum so that solution travels around the parts to be plated as a turbulent flow from the bottom of the parts to the tops, and not from the sides. The Examiner is building a structure for the Applicant that the Applicant has not claimed. The vertical spargers of Admitted Prior Art have been removed and replaced with horizontal spargers. Therefore, Admitted Prior Art can't possibly anticipate or render unpatentable the claims of the present application.

Lace et al. (US Patent 4772371) discloses an electroplating apparatus for high-speed electroplating a cathodic strip of metal passed therethrough. The Lace reference does not disclose a horizontal sparger that replaces vertical spargers, as shown in the Applicant's Admitted Prior Art, and therefore, Lace does not cure the deficiencies of Applicant's Admitted Prior Art in combination and cannot stand on its own to render claims 1 and 15 as obvious.

One of ordinary skill in the art would not read Applicant's Admitted Prior Art and Lace, alone or in combination, and find the motivation, suggestion or teaching to produce the plating system of claims 1 and claims 15 of the Applicant's present application. In addition, claims 2-14 are also allowable by virtue of their dependency on independent claim 1.

Dated: May 9, 2007

By:

Respectfully submitted,

Buchalter Nemer, A Prof. Corporation



Sandra P. Thompson, PhD, Esq.

Reg. No. 46,264

E-mail: sthompson@buchalter.com

Direct Line: 949-224-6282

ATTORNEYS FOR APPLICANT(S):

Buchalter Nemer, A Professional Corporation
18400 Von Karman Ave., Suite 800
Irvine, CA 92612
Fax: 949-224-6203

APPENDIX OF PENDING CLAIMS

1. (Previously Presented) A plating system comprising:
an elongated upper channel and an elongated lower channel; and
a plating solution horizontal sparger comprising a series of inlets oriented to
direct any plating solution flowing through the inlets into one and towards
another of the upper and lower channels.
2. (Original) The system of claim 1 further comprising:
an anode; and
a substantially planar cathode comprising a first surface conductive surface, a
second conductive surface, and a perimeter edge, the first conductive
surface and second conductive surfaces being substantially parallel to
each other and positioned on opposite sides of the cathode; wherein
the sparger is positioned at least as close to the perimeter edge of the cathode
as to either of the first or second conducting surfaces.
3. (Original) The system of claim 2 wherein the sparger directs any plating solution
flowing through the inlets towards the cathode in a plane substantially coplanar
with the cathode.
4. (Original) The system of claim 3 wherein:
each of the upper and lower channels comprises two substantially planar and
parallel non electrically conductive sides that are substantially parallel to
the cathode; and
the cathode is positioned at least partially within each of the upper and lower
channels between the non electrically conductive sides.
5. (Original) The system of claim 4 wherein:

the upper and lower channels are positioned opposite each other and are separated from each other, the separation between the channels forming a pair of solution egress slots; and
the channels are adapted to prevent current from flow between the anode and cathode other than through the egress slots.

6. (Original) The system of claim 5 wherein the egress slots are positioned approximately parallel to a center line of the cathode.
7. (Original) The system of claim 6 wherein the cathode comprises a dielectric substrate and the conductive surfaces are adapted to promote the formation of heat spreaders on the dielectric substrate.
8. (Original) The system of claim 1 wherein each of the upper channel and lower channel have a width less than or equal to one inch.
9. (Previously Presented) The system of claim 1 wherein the horizontal sparger directs any plating solution flowing through the inlets into the lower channel and towards the upper channel.
10. (Original) The system of claim 1 wherein each of the upper channel and lower channel have a width less than or equal to 0.5 inches.
11. (Original) The system of claim 1 wherein each of the upper channel and lower channel have a width less than or equal to 0.5 inches, and the further comprising a plurality of part holding clamps electrically coupled to a power source and positioned within the upper channel or the lower channel.
12. (Original) The system of claim 1 further comprising a plurality of anodes positioned outside and along the length of the upper and lower channels.

13. (Original) The system of claim 1 wherein the upper channel and lower channel are separated by a distance and at least one of the upper channel and lower channel are adapted to be moved to vary the distance.
14. (Original) The system of claim 1 wherein the shortest distance from a part being plated to a channel wall is less than the shortest distance between the channel wall and an anode.
15. (Previously Presented) A plating system comprising:
an anode, a planar cathode, a horizontal sparger, and a plurality of electrically insulating shields; wherein
each of the plurality of shields is positioned between the anode and the cathode but not between the sparger and the cathode, and each of the plurality of shields is approximately co-planar with one of two reference planes that are substantially parallel to the cathode; and
the sparger is adapted to direct plating fluid toward and edge of the cathode along in a plane substantially co-planar with cathode.

Claims 16-18: Canceled.

EVIDENCE APPENDIX

There is no additional evidence at this time of which the Applicant's are aware.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings at this time of which the Applicant's are aware.